

Metabolic Syndrome: Hypertension, Diabetes and Obesity: A mini-review

Sebastião David Santos-Filho, Ph.D.

Fisioterapia, Faculdade Maurício de Nassau, Natal, RN, Brasil,
sebastiao.filho@mauriciodenassau.edu.br; sdavidsfilho@gmail.com
 Biofísica e Biometria, Universidade do Estado do Rio de Janeiro, RJ, Brasil,
santos-filho@uerj.br

ABSTRACT

This work aims to present the relation to metabolic syndrome with cardiovascular diseases and shows parameters given by ATP III and NHANES III studies. The principal results of these studies were presented in this work. The actual tendency about hypertension, diabetes and obesity are also showed. The conclusion indicates the use of these parameters to obtain quality of life.

BACKGROUND

Some efforts are been to identify cardiovascular risk factors and to interfere in the high-risk patients. The association of these factors increases significantly the incidence of cardiovascular diseases (CVD). Beyond of that, it knows that individuals with pressure same levels will be different evolution in the dependence of the associated risk factors that following then, as well as the lifestyle of each one (1).

The metabolic syndrome (MS) is characterized by hyperglycemia/ glucose intolerance, low HDL cholesterol, hypertension and obesity, it will be considered based in the results of actual series, as important and independent risk factor for CVD, between these myocardial infarction (MI) and cerebral vascular accident (CVA), and more chance of development of Diabetes Mellitus (DM) (2-4).

With base in the results of the study NHANES III, the MS in adults, in the Germany and Europe, affect proximity of 10 million of people (8) and in the United States the prevalence is estimated in 23.7%, or proximity 47 million of people, it will be this of 7% in the age range of 20 to 29 years and of 40% in the individuals with 60 years or more (5). This

prevalence also their intimacy related to the grade of obesity of the population (see table 1).

The actual tendency is that their prevalence continues grow-up, due to the rapid increase of the obesity people tax and to the elderly of the population.

The World Health Organization (WHO) purpose a definition for MS in 1998, and more recently NCEP-ATP III elaborated a new concept in 2001, which is further utilized in the clinic practice (9, 10).

According in the *guidelines* of the ATP (Adult Treatment Panel) III, the patients are defined as MS when they presented 3 or more of the 5 criteria above related (see in table 2).

It accepts that the insulin resistance (IR) is first alteration that more contributed for the find's modifications in the MS, it been the obesity (manly the centipede obesity) a risk factor important to the state of IR (2). It was remembered that not all obese patient's development IR and that not all the patients with MS are obesity (6).

Into of the physiopathology context of the MS it must also considered an increase of the oxidative stress, increase levels of

inflammatory markers (4), decrease fibrinolysis, microalbumin, autonomic regulation abnormalities (7), and renin-angiotensin-aldosterone system activation (5). The mainly clinic impact of the MS is in the fact of it is related in the increase of the risk to CVD and MD, also in the age adjustments, familiar history, smoking, and levels of LDL cholesterol (5, 8).

Related to the MD, the MS increase the risk in 5 and 9 times for the development of the disease, although that for CVD (MI/CVA) the risk is increase in proximity 4 times in men (5). According to the observed in the NHANES III study the MS is significantly associated with myocardium infarct and cerebral vascular disease in both the genders (3, 9).

Related to the patient's clinic with MS, the first step is identifying these patients, using of the physical examination and routine laboratory tests, have the conscience of that these can be considered of high risk to the development of CVD and MD and orientate then to respect the changes in the life style, in what must be based the treatment. It will be promoted the weight reduction and regularly physical exercises practice (4).

Some cases necessity of pharmacologic therapeutics. According the recommendations of the VII Joint, the class I hypertension patients (AP > 140/90 mmHg) having MS it will be received anti-hypertensive drugs. Some authors support the use of the ECA inhibitors and calcium channel antagonists and AT1 receptor antagonists (8) preferentially to the use of the beta-blockers and thiazide in these patients, although this stills not a conscience. The dyslipidemia patients (TG/HDL) that it not responding to the treatment not pharmacologic must be treated according the needs.

The real benefit in the treatment of the arterial hypertension only will be complete if was been processed all the corrections of the clinic disorders, metabolic that follow the patient, beyond of correct the increase of the arterial pressure for an action multidisciplinary and comprehensive (1). Through the related adverse effects with CVD and MS its early detection and it treatment will be extremely important in the benefit obtain long-term (8).

TABLE 1: Estimated Prevalence of metabolic syndrome (MS), using the defined criteria do ATP III, in patients with normal weight, upper-weight and obesity, of each gender, in the study NHANES III

Category	IMC Kg/m ²	Prevalence of <u>MS</u>	
		Man	Woman
Normal weight	< 25	4.6%	6.2%
Upper-weight	25 – 29.9	22.4%	28.1%
Obesity	>30	59.6%	50%

TABLE 2: The criteria by ATP III for definition of Metabolic Syndrome (9, 10).

1. Arterial pressure:
≥ 130 mmHg de SAP (Systolic Arterial Pressure).
≥ 85 mmHg de DAP (Diastolic Arterial Pressure).
2. Glycemia ≥ 110mg/dl.
3. Triglycerides ≥ 150 mg/dl.
4. Abdominal Circumference:
> 102 cm in men.
> 88 cm in women.
5. HDL cholesterol:
< 40 mg/dl in men.
< 50 mg/dl in women.

CONCLUSION

The benefits obtain in follow these parameters of hypertension, diabetes and obesity that composed the metabolic syndrome sustain the quality of life of the patients.

There is no conflict of interest about this work.

REFERENCES:

- [1] Pilacinski S., Zozulinska-Ziolkiewicz D.A. (2014) Influence of lifestyle on the course of type 1 diabetes mellitus. Arch Med Sci. 10(1): 124-134.
- [2] Chen R, Oubagele B, Feng W. (2016) Diabetes and stroke: Epidemiology, pathophysiology, pharmaceuticals and outcomes. Am J Med Sci. 351(4): 380-396.
- [3] Tun N.N., Arunagirinathan G., Munshi S.K., Pappachan J.M. (2011) Diabetes mellitus and stroke: a clinical update. World J Diabetes. 8(6): 235-248.
- [4] Arboix A. (2015) Cardiovascular risk factors for acute stroke: Risk profiles in the different subtypes of ischemic stroke. World J Clin Cases. 3(5): 418-429.
- [5] Park YW, Zhu S, Palaniappan L, Heshka S, Carnethon MR, Heymsfield SB. (2003) The metabolic syndrome: Prevalence and associated risk factor findings in the US population from the Third National Health and Nutrition Examination survey, 1988-1994. Arch Intern Med. 163(4): 427-436.
- [6] Bray G, Heisel W, Afshin A, Jensen M, Dietz W, Long M, Kushner R, Daniels S, Wadden TA, Tsai A, Hu F, Jakicic J, Ryan D, Wolfe B, Inge TH. (2018) The science of obesity management: An endocrine society scientific statement. Endocrine Reviews. 39(2):79-132.
- [7] Rosembaum P. (2003) Uma atualização em risco cardiovascular da síndrome metabólica. Arq Bras Endocrinol Metab. 47(3):220-227.
- [8] Alexander CM, Landsman PB, Teutsch SM, Haffner SM. (2003) NCEP-defined metabolic syndrome, diabetes, and prevalence of coronary heart disease among NHANES III participants age 50 years and older. Diabetes. 52(5): 1210-1214.
- [9] Pelikanova T. (2003) The metabolic syndrome. Vnitr Lek. 49(12):900-906.
- [10] Ahmed A, Khan TE, Yasmeen T, Awan S, Islam N. (2012) Metabolic syndrome in type 2 diabetes: comparison of WHO, modified ATP III and IDF criteria. J Pak Med Assoc. 62(6):569-574.